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Phytic acid, *myo*-Inositol hexakisphosphate (IHP), is one of the predominant forms of organic P in soil, and most IHP in soil is derived from plant residues. However, IHP in acidic soil forms insoluble mineral complexes with Fe, and Al. Thus, it is not yet well understood how Fe-, and Al-IHP is mineralized and becomes available to plants. Recently, we confirmed P transfer from Fe-IHP via arbuscular mycorrhizal fungi to host plant, suggesting that Fe-IHP may be degraded by microbes (Hara et al., 2016). Furthermore, we isolated IHP utilizing bacteria around alginate beads containing Fe-IHP buried in arbusuclar mycorrhizal hyphosphere and found that major isolates were *Sphingomonas* spp. and *Arthrobacter* spp. In this study, we evaluated ability of these isolated IHP utilizing strains to liberate inorganic P (Pi) from Fe-IHP .

Total 8 strains of *Arthrobacter* spp., *Caulobacter* spp. and *Sphingomonas* spp., which were isolated from alginate beads containing Fe-, or Ca-IHP buried in soil in previous study (Hara et al., 2016), were used. The Fe-IHP degrading activity was estimated by release of Pi in a phytate-specific limiting medium (Richardson et al., 1997) which contained 1 mM Fe-IHP as the sole P source. Test strains were grown in 10 mL of the phytate-specific limiting medium with horizontal shaking (150 rpm) at 25°C for 1 week. Release of Pi to the medium was examined. The concentration of Pi was measured by the malachite green method.

Four strains, 2 strains of *Arthrobacter* spp. and 2 strains of *Sphingomona*s spp., which were isolated from the alginate beads containg Fe-IHP showed significantly higher Pi concentration in the medium than that without inoculation, indicating release of Pi from Fe-IHP. Amount of released Pi was 2.9 mg Pi L^{-1} in *Arthrobacter* sp. FeAH19, and that in *Sphingomonas* sp. FeGH1 was 1.4 mg Pi L^{-1}. On the other hand, other 4 strains, 2 strains of *Caulobacter* sp. and 2 strains of *Sphingomonas* spp., which were isolated from the alginated beads containing Ca-IHP did not show release of Pi from Fe-IHP. Because these strains can release inorganic P from soluble IHP, such as Ca-IHP and Na-IHP, removal of Fe from Fe-IHP may be a key step of Fe-IHP degradation.

References

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